



# SPARSE ARRAY TECHNOLOGY FOR 3D SONAR IMAGING SYSTEMS



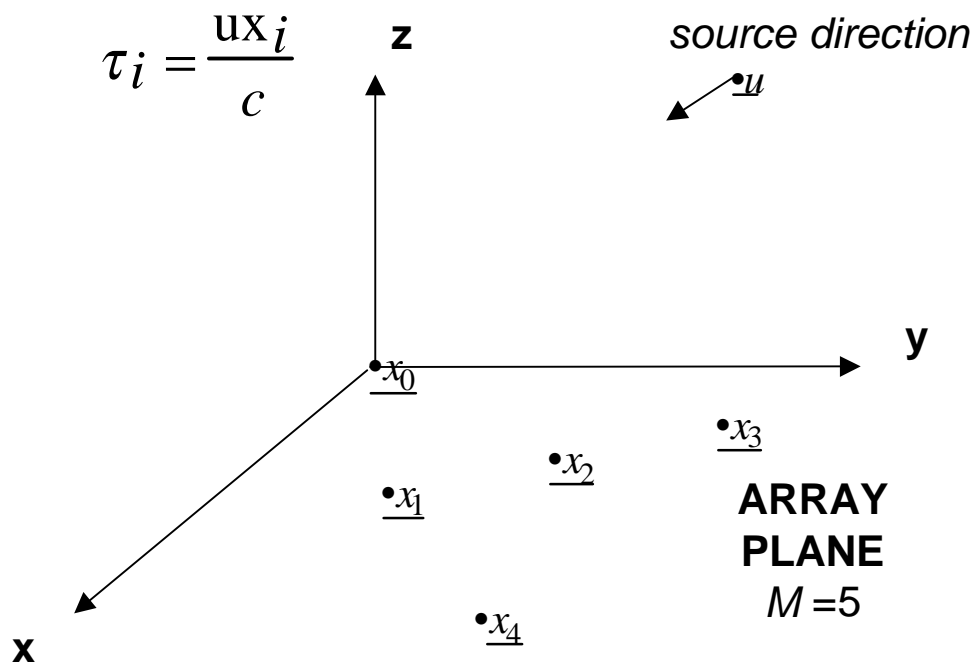
- Broadband Ultra-sparse Acoustic Arrays
- Final planar array 225 elements over  $256 \lambda \times 256 \lambda$  area
- Bandwidth: 30% of center frequency,  $F_0$

**JOHN IMPAGLIAZZO**  
**NAVAL UNDERSEA WARFARE CENTER**

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE <b>25 AUG 1999</b>		2. REPORT TYPE <b>N/A</b>		3. DATES COVERED <b>-</b>	
4. TITLE AND SUBTITLE <b>Sparse Array Technology for 3D Sonar Imaging Systems</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Naval Undersea Warfare Cente</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release, distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>DARPA, Air-Coupled Acoustic Microsensors Workshop held on August 24 and 25, 1999 in Crystal City, VA., The original document contains color images.</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>UU</b>	18. NUMBER OF PAGES <b>6</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

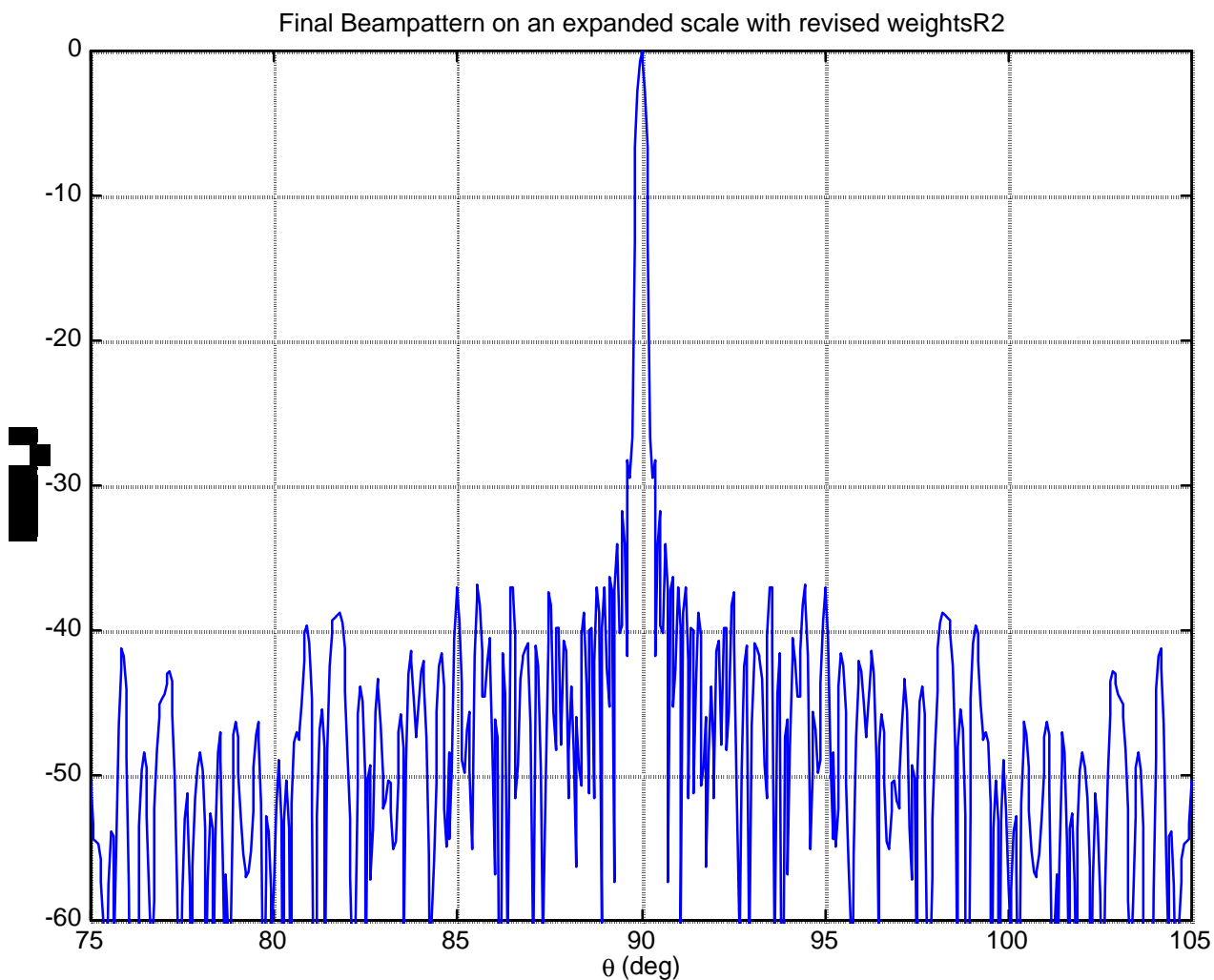
# BROADBAND BEAMPATTERN

$$B(\Theta_x, \Theta_y) = \left( \sum_{i=0}^{M-1} w_i \cos(2\pi F_o \tau_i) \frac{\sin(\pi \tau_i W)}{\pi \tau_i W} \right)^2$$



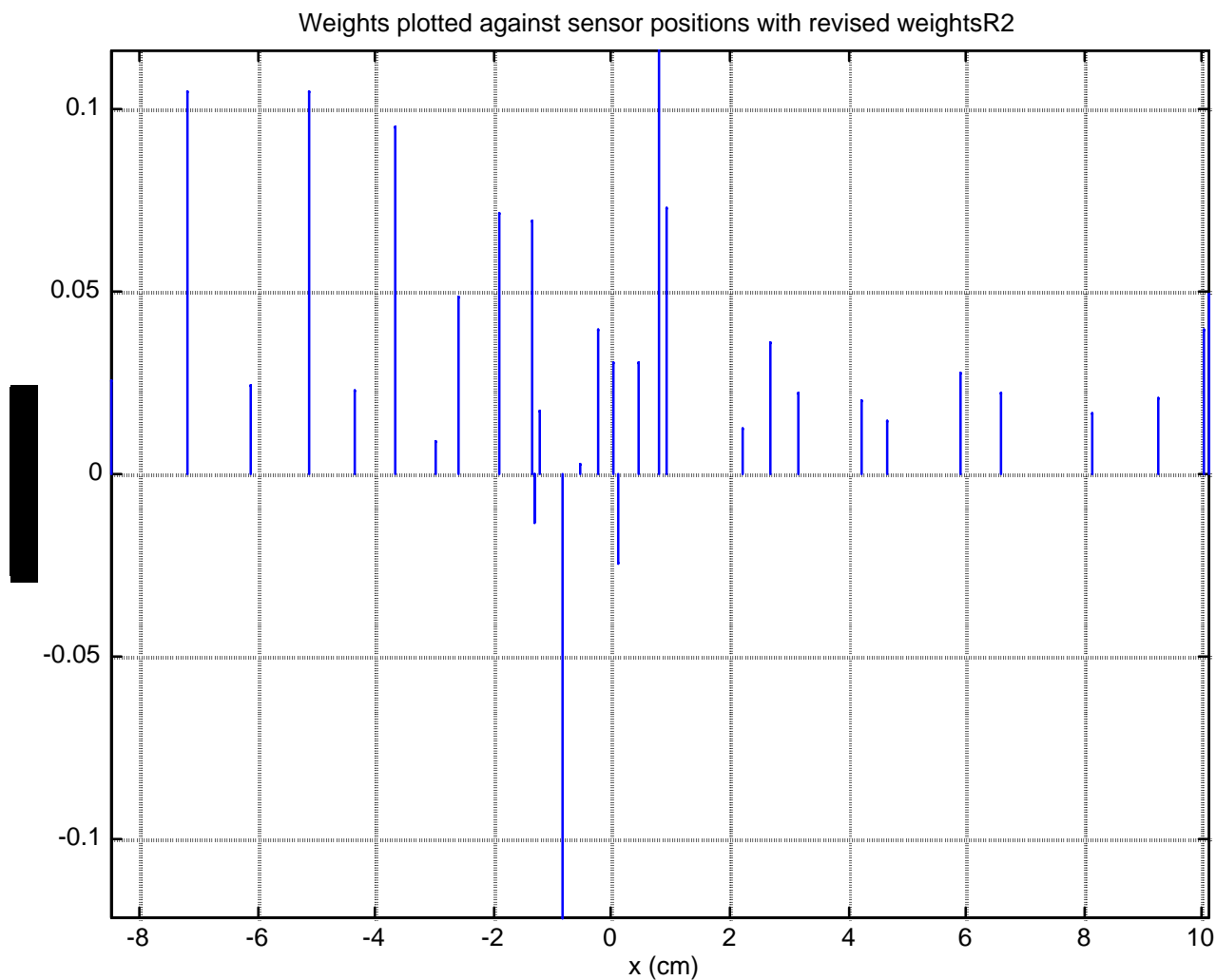


# PROTOTYPE 1D ARRAY THEORETICAL BEAMPATTERN



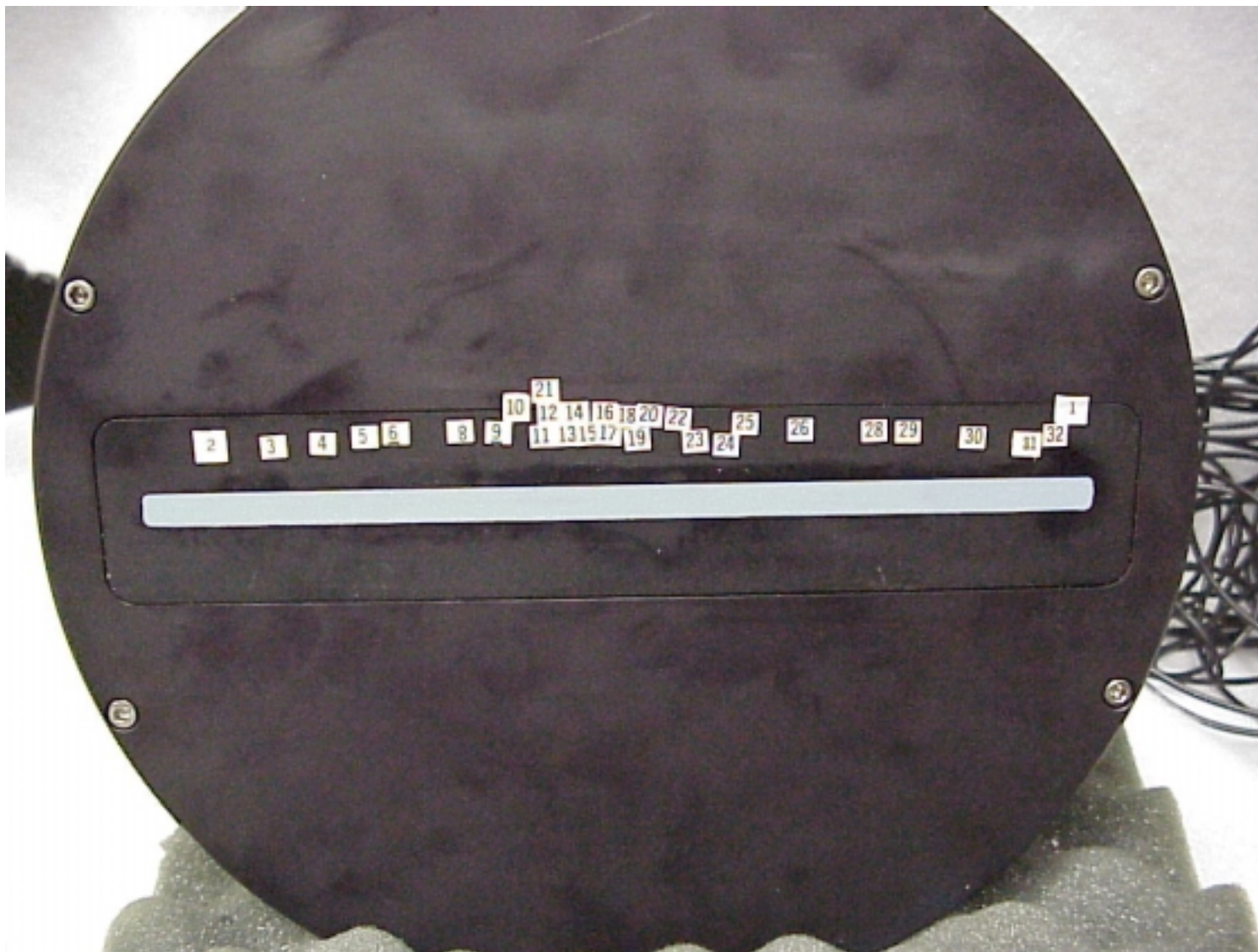


# PROTOTYPE 1D ARRAY ELEMENT LOCATIONS & WEIGHTS





# PROTOTYPE SPARSE LINEAR ARRAY







# ACOUSTIC TEST FACILITY

